

REMARKS/ARGUMENTS

Claims 14-20 are pending in this application. By this Amendment, Applicant amends Claims 14, 15, 17, 18, and 20 and cancels Claims 8-13 and 21.

Applicant's counsel appreciates the courtesies extended by the Examiner in the Telephone Interview on February 23, 2010. Prior to the Telephone Interview, Applicant's counsel faxed a proposed amendment to claim 14 to the Examiner for the Examiner's review. In the Telephone Interview, the Applicant's counsel explained the differences between the applied prior art (primarily Sakai (US 2001/0026435) and Alcoe (U.S. 7,087,846)) and the present invention, and the benefits that are obtained by the present invention.

Particularly, paragraphs [0011] and [0012] of Applicant's originally filed Substitute Specification disclose:

Preferably, the internal conductor pattern is printed on a ceramic sheet having the via hole formed therein and the via hole be filled with a conductive material at the same time, providing a carrier film on the back surface of the ceramic sheet.

According to preferred embodiments of the present invention, since the shape of the second land connected to a via hole in which thin spots are likely to occur during screen printing is enlarged, the discharge amount of conductive paste for forming the second land increases and appropriate filling of the via hole and the prevention of thin spots in the second land are provided. As a result, a laminated ceramic electronic component in which the reliability and productivity are outstanding is obtained.

Accordingly, as discussed in the Telephone Interview of February 23, 2010, Applicant's Claim 14 has been amended to recite the features of "screen printing a coil conductor pattern having a first land at one end of the coil conductor pattern and a second land at the other end of the coil conductor pattern on the surface of a ceramic sheet having a hole for a via hole formed therein by using a conductive material such that the first land covers the hole for via hole" and "simultaneously filling the conductive material in the hole for the via hole during the step of screen printing the coil conductor pattern." Support for these features is found, for example, in paragraphs [0011] and

[0026] of Applicant's originally filed Substitute Specification.

Claim 21 was objected to under 37 C.F.R. § 1.75(c), as allegedly being in improper dependent form. Claim 21 has been canceled. Accordingly, Applicant respectfully submits that this objection is moot.

Claims 8-10 and 14-16 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Sakai (US 2001/0026435) in view of Alcoe (U.S. 7,087,846). Claims 11-13 and 18-20 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Sakai in view of Alcoe, and further in view of Maeda et al. (US 2005/0122699). Claims 17 and 21 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Sakai in view of Alcoe, and further in view of Niwa et al. (U.S. 4,237,606). Claims 8-13 and 21 have been canceled. Applicant respectfully traverses the rejections of Claims 14-20.

Claim 14 has been amended to recite:

A manufacturing method for a laminated ceramic electronic component, comprising the steps of:

screen printing a coil conductor pattern having a first land at one end of the coil conductor pattern and a second land at the other end of the coil conductor pattern on the surface of a ceramic sheet having a hole for a via hole formed therein by using a conductive material such that the first land covers the hole for via hole;

simultaneously filling the conductive material in the hole for the via hole during the step of screen printing the coil conductor pattern; and

laminating a plurality of ceramic sheets such that the first land in one of the plurality of ceramic sheets is electrically connected to the second land in another of the plurality of ceramic sheets through the via hole formed in the one of the plurality of ceramic sheets to obtain a laminate; wherein

an area of the via hole is less than an area of the first land and an area of the second land; and

the area of the second land is greater than the area of the first land.

The Examiner alleged that Sakai teaches all of the features recited in Applicant's Claim 14, except for the feature of the area of the second land is greater than the area of the first land. The Examiner further alleged that Alcoe teaches a second land 25 having an area that is greater than an area of a first land 29. Thus, the Examiner

concluded that it would have been obvious “to use a larger second land for a conductor as taught by Alcoe in the electronic device of Sakai, in order to connect to larger size via hole, and in order to be able to allow slight variations in alignment of the via with the land when the layers are laminated.”

As noted above, Applicant’s Claim 14 has been amended to recite the features of “screen printing a coil conductor pattern having a first land at one end of the coil conductor pattern and a second land at the other end of the coil conductor pattern on the surface of a ceramic sheet having a hole for a via hole formed therein by using a conductive material such that the first land covers the hole for via hole” and “simultaneously filling the conductive material in the hole for the via hole during the step of screen printing the coil conductor pattern.”

As discussed in the Telephone Interview on February 23, 2010, in contrast to Applicant’s Claim 14, paragraphs [0010] to [0016] of Sakai specifically disclose:

FIG. 3 shows a method for forming a via-hole conductor.

A ceramic green sheet 1 for forming a ceramic layer is handled while attached to and backed by a carrier film 2. A through-hole 3 is formed through the ceramic green sheet 1 and the carrier film 2. The ceramic green sheet 1 backed by the carrier film 2 is placed on a vacuum apparatus 4.

The vacuum apparatus 4 includes a vacuum chamber 5, and a negative pressure is applied to the vacuum chamber 5 as indicated by arrows 6. The opening of the vacuum chamber 5 is closed by a suction plate 7, which is provided with many small air paths (not shown in the drawing).

A porous sheet 8 composed of paper or other filtering material is placed on the upper surface of the suction plate 7. The porous sheet 8 is provided with a smooth surface at least on the upper surface thereof. The ceramic green sheet 1 is placed so as to be in contact with the porous sheet 8, and the carrier film 2 is positioned on the upper surface of the ceramic green sheet 1.

In such a state, when a negative pressure is applied to the vacuum chamber 5 as indicated by the arrows 6, the negative pressure acts at the inside of the through-hole 3 via the suction plate 7 and the porous sheet 8.

In this state, a conductive paste 9 is applied to the upper side of the carrier film 2. The conductive paste 9 is moved onto the carrier film 2 by moving a squeegee 10 along the upper surface of the carrier film 2, and the conductive paste 9 is filled into the through-hole 3 by the effect of the

negative pressure during the squeegeeing process. By filling the through-hole 3 with the conductive paste 9 from the side of the carrier film 2, while using the carrier film 2 as a mask as described above, a via-hole conductor 11 is formed in the through-hole 3.

Next, the ceramic green sheet 1 backed with the carrier film 2 is detached from the porous sheet 8, and as shown in FIG. 4, by printing the conductive paste on the principal surface on the side of the ceramic green sheet 1, followed by drying, a line conductor 12 is formed. The line conductor 12 is connected to the via-hole conductor 11.

That is, Sakai specifically discloses a step of first filling the conductive paste 9 in the through-hole so as to form a via-hole conductor 11, and then in a separate, subsequent step, forming a line conductor 12 and connecting the line conductor 12 to the via-hole conductor 11 by printing the conductive paste on a principal surface of the ceramic sheet 1. Sakai clearly fails to teach or suggest that the via-hole conductor 11 and the line conductor 12 could or should be simultaneously formed.

Thus, as acknowledged by the Examiner in the Telephone Interview on February 23, 2010, Sakai fails to teach or suggest the features of "screen printing a coil conductor pattern having a first land at one end of the coil conductor pattern and a second land at the other end of the coil conductor pattern on the surface of a ceramic sheet having a hole for a via hole formed therein by using a conductive material such that the first land covers the hole for via hole" and "simultaneously filling the conductive material in the hole for the via hole during the step of screen printing the coil conductor pattern" as recited in Applicant's Claim 14.

Alcoe fails to teach or suggest any screen printing method whatsoever, and thus, certainly fails to teach or suggest the features of "screen printing a coil conductor pattern having a first land at one end of the coil conductor pattern and a second land at the other end of the coil conductor pattern on the surface of a ceramic sheet having a hole for a via hole formed therein by using a conductive material such that the first land covers the hole for via hole" and "simultaneously filling the conductive material in the hole for the via hole during the step of screen printing the coil conductor pattern" as recited in Applicant's Claim 14.

Accordingly, Applicant respectfully requests reconsideration and withdrawal of the rejection of Claim 14 under 35 U.S.C. § 103(a) as being unpatentable over Sakai in view of Alcoe.

The Examiner relied upon Maeda et al. and Niwa et al. to allegedly cure various deficiencies of Sakai and Alcoe. However, Maeda et al. and Niwa et al. fail to teach or suggest the features of “screen printing a coil conductor pattern having a first land at one end of the coil conductor pattern and a second land at the other end of the coil conductor pattern on the surface of a ceramic sheet having a hole for a via hole formed therein by using a conductive material such that the first land covers the hole for via hole” and “simultaneously filling the conductive material in the hole for the via hole during the step of screen printing the coil conductor pattern” as recited in Applicant’s Claim 14. Therefore, Maeda et al. and Niwa et al. fail to cure the deficiencies of Sakai and Alcoe described above.

Accordingly, Applicant respectfully submits that Sakai, Alcoe, Maeda et al., and Niwa et al., applied alone or in combination, fail to teach or suggest the unique combination and arrangement of features recited in Applicant’s Claims 8 and 14.

In view of the foregoing amendments and remarks, Applicant respectfully submits that Claim 14 is allowable. Claims 15-20 depend upon Claim 14, and are therefore allowable for at least the reasons that Claim 14 is allowable.

In view of the foregoing amendments and remarks, Applicant respectfully submits that this application is in condition for allowance. Favorable consideration and prompt allowance are solicited.

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The Commissioner is authorized to charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account No. 50-1353.

Respectfully submitted,

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